

September 1998

**DEPARTMENT OF  
STATE IRM****Modernization  
Program at Risk  
Absent Full  
Implementation of Key  
Best Practices**

19981013 055



United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-280832

September 29, 1998

The Honorable Harold Rogers  
Chairman, Subcommittee on Commerce, Justice,  
State, the Judiciary, and Related Agencies  
Committee on Appropriations  
House of Representatives

The Honorable Benjamin Gilman  
Chairman, Committee on International Relations  
House of Representatives

The Department of State is spending hundreds of millions of dollars to replace its antiquated information technology (IT) infrastructure with modern hardware and software systems. In January 1997, the Department of State issued its 5-year, \$2.7-billion information resource management (IRM) strategic plan which is designed to achieve a number of key goals by the end of fiscal year 2001, including (1) installing Year 2000 compliant hardware and software systems throughout State, (2) upgrading State's IT infrastructure, and (3) instituting professional management principles in all facets of State's IT operations. State's strategic plan is accompanied by a tactical plan that describes the 65 modernization projects designed to achieve the Department's strategic plan objectives.

In light of disappointing results from prior State modernization efforts and widely publicized accounts of failed and costly modernization programs at several other federal agencies, you asked us to examine the soundness of State's approach to modernizing its IT infrastructure. This report provides information and analysis on the progress made by State in implementing key IT management oversight and investment planning requirements mandated in recent federal legislation and related Office of Management and Budget (OMB) guidance. We also examined the soundness of the 5-year cost estimate included in the Department's IRM strategic plan and whether this estimate incorporates potential cost savings and efficiencies from State's modernization efforts.

## Background

The Department faces the difficult and challenging task of replacing its classified and unclassified systems with hardware and software systems that are Year 2000 compliant and fully satisfy the Department's

information resource needs.<sup>1</sup> With an IT workforce of over 3,400 individuals, State manages a complex mix of approximately 260 discrete information systems designed to support a broad range of diplomatic and administrative functions. The Department relies on these systems for much of its operations including diplomatic messaging, visa and passport processing, and administrative functions such as financial, personnel, and logistics management. In fiscal year 1998, State has budgeted \$573 million to conduct its IT operations, of which \$293 million is budgeted for its modernization efforts. Key modernization projects include upgrading the unclassified IT infrastructure at posts worldwide, instituting a series of messaging system improvements, modernizing the Department's financial management systems, and launching a number of IT management improvements in such areas as IT architecture planning, project planning and management, human resource planning, and IRM training.

State has recognized for years that its IT hardware and software platforms are aging and inefficient, making it difficult to conduct business in today's information-driven society. Beginning in the early 1990s, State has experienced difficulties in achieving its short and long-term modernization goals. For example, in August 1994, we reported that State's attempt to modernize its financial management systems was subject to a high risk of failure because the Department's management and planning for this effort had been inadequate.<sup>2</sup> Subsequently, in 1995, State ended this effort and adopted a revised approach to modernizing its domestic and overseas financial systems. In December 1994, we reported that State had placed several major modernization efforts at risk by not following a number of IRM management best practices, including the need to develop an integrated information technology architecture to help guide the Department's investment decisions.<sup>3</sup> In July 1995, State issued a report on its modernization efforts that noted that accelerating the pace of

<sup>1</sup>On January 1, 2000, computer systems that are not Year 2000 compliant will malfunction or produce inaccurate information because the year 2000 will be indistinguishable from the year 1900. This problem is rooted in the fact that many computer systems use only two digits to designate the year. We recently reported on State's progress in addressing Year 2000 issues. See Year 2000 Computing Crisis: State Department Needs to Make Fundamental Improvements to Its Year 2000 Program (GAO/AIMD-98-162, Aug. 28, 1998).

<sup>2</sup>Financial Management: State's Systems Planning Needs to Focus on Correcting Long-standing Problems (GAO/NSIAD-94-141, Aug. 12, 1994).

<sup>3</sup>Department of State: Strategic Approach Needed to Better Support Agency Mission and Business Needs (GAO/AIMD-95-20, Dec. 22, 1994).

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implementation would require that systematic changes be made to the Department's IT management practices.<sup>4</sup>

The 1995 Paperwork Reduction Act,<sup>5</sup> the 1996 Clinger-Cohen Act,<sup>6</sup> and related OMB guidance lay out a number of required best practices designed to help federal agencies better manage their IT resources. The Paperwork Reduction Act is the "umbrella" IT legislation for the federal government, while the Clinger-Cohen Act requires that federal agencies establish a disciplined approach to managing IT resources. This legislation and guidance requires that the head of each executive agency design and implement a process for maximizing the value, and assessing and managing the risks, of IT acquisitions. Key actions called for include appointing a Chief Information Officer, preparing an IRM strategic plan, establishing a rigorous planning and investment process, and developing an integrated information architecture to ensure that agency resources are utilized in the most effective manner possible. These and other IT management requirements are summarized in OMB's July 1997 capital programming guide and our February 1997 IT investment guide.<sup>7</sup>

Consistent with federal legislation and OMB guidance, State appointed a Chief Information Officer, prepared an IRM strategic plan and related tactical plans, and developed a conceptual IT planning and investment framework consisting of three IRM oversight boards to manage its IT planning and investment process. The conceptual framework called for an IRM Program Board to review project proposals and periodically assess the implementation status of ongoing projects, an IRM Technical Review Board to ensure that IT projects are technically sound and that adequate architectural and budget planning takes place, and an IRM Configuration Control Board to ensure that existing and planned systems will effectively operate together.

State's conceptual framework requires that all three governing boards coordinate their activities to achieve the goals of the IT planning and investment process. These goals include (1) ensuring that IRM decisions

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<sup>4</sup>Accelerating Modernization at the Department of State: A Report of the Strategic Management Initiative Information Technology Team (Office of the Chief Information Officer, U.S. Department of State, July 17, 1995).

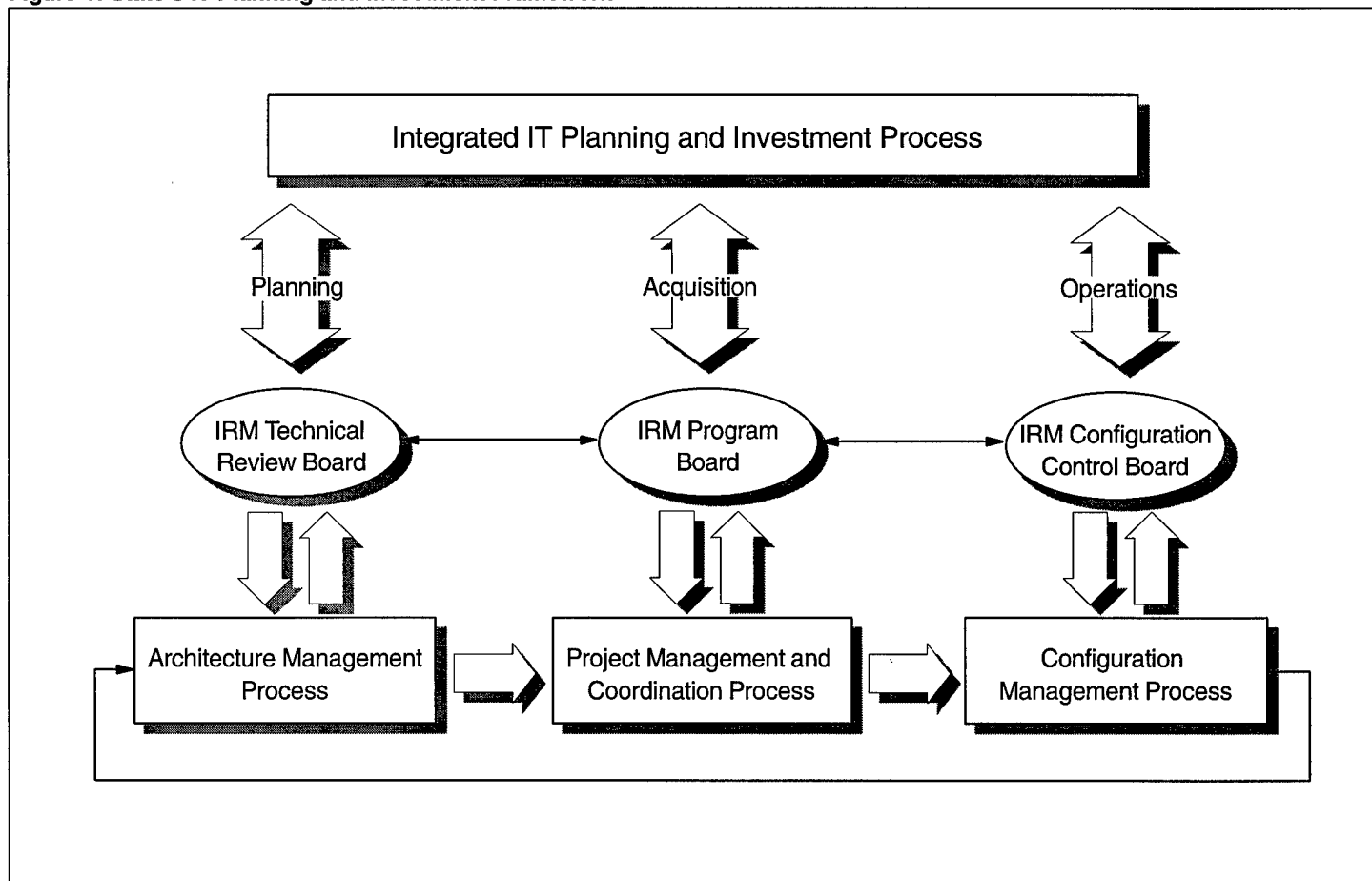
<sup>5</sup>Public Law 104-13, 109 Stat. 163.

<sup>6</sup>Public Law 104-106, 110 Stat. 679.

<sup>7</sup>Capital Programming Guide (Washington, D.C.: OMB, July 1997) and Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-Making (GAO/AIMD-10.1.13, Feb. 1997).

are integrated with the organization's structure and budget, (2) assessing the knowledge and skills of the Department's IT workforce relative to perceived requirements, (3) establishing performance measures, (4) analyzing mission and related business processes, (5) evaluating investments, and (6) measuring progress against established implementation goals. Key anticipated "outputs" from State's conceptual framework include an information technology architecture, a strategic plan, a tactical plan listing approved projects, a human resource plan for IT workers, and long-term funding estimates developed through the use of a "cost model." Figure 1 illustrates the component parts of State's conceptual framework.

**Figure 1: State's IT Planning and Investment Framework**



Source: Department of State.

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## Results in Brief

State has developed an information technology planning and investment framework for managing its IT resources that is consistent with the intent of applicable federal guidance. However, full implementation of the framework does not appear to be a top management priority. Without a fully functioning framework, State cannot be assured that it is making the most cost-effective decisions as it modernizes its information technology operations, that systems will perform as expected, or that its information technology cost estimates are sound. As a result, there is substantial risk that State's modernization program will not achieve desired results, will cost more than anticipated, and will take longer to put in place.

State's oversight mechanisms are not fully functioning as envisioned in its conceptual framework. While an IRM Program Board has been established, it has not yet adopted the more disciplined project management processes called for by the Clinger-Cohen Act and related OMB guidance. The IRM Technical Review Board and IRM Configuration Control Board remain to be fully established. State also does not yet have an agency-approved information technology architecture to help guide the Department's investment decisions. The Department has not established a specific action plan or related timetable to implement these remaining components of the framework. Department officials attributed delays in implementing this framework to a number of factors, including senior management turnover, internal reorganization, competing priorities such as the Year 2000 and computer security issues, staffing shortages, and the absence of an agreed upon vision regarding the Department's technical direction and operational requirements.

State's 5-year cost estimate, prepared in October 1996 and referenced in State's strategic plan submitted to the Congress, is speculative. First, the estimate was not based on a rigorous analysis of information technology requirements and related project funding needs. Second, an estimated \$600 million in Consular Affairs' information technology costs were not included in the estimate. Third, some of the requirements and associated costs included in the original estimate have changed. Finally, State's original budget estimate and related planning documents do not identify or quantify potential cost savings opportunities associated with its ongoing information technology support and IRM modernization activities.

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## Key Components of State's IT Planning and Investment Process Remain to Be Implemented

Although State appointed a Chief Information Officer and established an IRM Program Board, its other two governing boards—the IRM Technical Review Board and IRM Configuration Control Board—are not fully functioning. In addition, while State does have an active IRM Program Board, this board is not yet functioning as intended by the Clinger-Cohen Act and related OMB guidance. Moreover, State has not put in place a Department-approved information technology architecture, a key output referred to in its conceptual framework.

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## IRM Management Oversight Boards Not Adequately Implemented

According to State's conceptual framework, the IRM Program Board has primary responsibility for the project management and coordination process, which focuses on approving and monitoring projects, devising acquisition plans, and periodically assessing State's total IT portfolio. This portfolio includes existing projects, pending projects, and ongoing support activities. The board, consisting of senior-level managers, was established in 1995.

The IRM Program Board has not yet adopted a "portfolio-based" approach to managing the Department's IT resources. This approach requires adopting specific evaluation criteria for comparing and prioritizing alternate investment options as called for by the Clinger-Cohen Act and related OMB guidance. According to senior officials familiar with the operations of the IRM Program Board, the board has not yet systematically prioritized State's tactical plan projects or reviewed the overall mix of funded projects, proposed projects, and ongoing support expenses. Although State officials noted that projects that clearly relate to the Year 2000 issue are afforded top priority, they agreed that ultimately all existing and proposed projects will have to receive a carefully considered priority ranking.

Until recently, the IRM Program Board had not mandated a standard approach to developing project papers or required the inclusion of certain analytical tools such as cost-benefit analyses; return-on-investments calculations; alternatives analyses, including the potential use of outsourcing; risk assessments; and consideration of the need for business process reengineering. To address these concerns, State's Chief Information Officer released an August 1998 memorandum detailing the Department's new requirements regarding a standardized format for project proposals. These requirements include a list of expected analyses that cover the areas outlined above. This is a positive first step. However, the quality and rigor of analyses prepared in response to these

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requirements will ultimately determine their utility to the Department and the IT planning and investment process.

The IRM Technical Review Board has primary responsibility for the IT architecture management process. This process focuses on developing key planning documents such as the information technology architecture, security and technical standards, and a cost model to chart long-term funding needs and trends. The IRM Technical Review Board held an organizing meeting in February 1998 and as of August 1998 had not held a subsequent meeting. The absence of a functioning IRM Technical Review Board has hampered State's ability to prepare adequate IRM planning documents, such as an information technology architecture, and reduced the level of technical scrutiny project proposals receive.

According to State's conceptual framework, the IRM Configuration Control Board has primary responsibility for maintaining an inventory of agency information resources, monitoring all proposed hardware and software proposals for compatibility with State's existing systems, and ensuring that all proposed changes conform to the Department's information technology architecture. Although State has established a number of project-specific control boards whose activities should be coordinated by the overall board, the IRM Configuration Control Board has never been formally constituted. The absence of the board increases the risks that State's new systems will have compatibility problems due to the implementation of conflicting technical standards.

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### State Lacks an Integrated Information Technology Architecture

State has not implemented an information technology architecture as required by federal legislation and related OMB guidance. As computer systems have become larger and more complex over the last decade, the importance of, and reliance on, information systems architectures has grown steadily. These comprehensive "blueprints" systematically detail the full breadth and depth of an organization's mission and methods of operation in (1) logical terms, such as defining business functions and providing high-level descriptions of information systems and their interrelationship and (2) technical terms, such as specifying hardware, software, data communications, security, and performance characteristics. Without an architecture to guide and structure a modernization program, there is no systematic way to prevent either inconsistent system design and development decisions or the resulting suboptimal performance and added cost associated with incompatible systems.



The Congress and OMB have recognized the importance of agency information systems architectures. The Clinger-Cohen Act, for example, requires Chief Information Officers to develop, maintain, and facilitate the implementation of an integrated information technology architecture. In addition, OMB has issued guidance that, among other things, requires agencies' information systems investments to be consistent with such architectures. OMB has also issued guidance on the development and implementation of agency information technology architectures.<sup>8</sup>

State began developing an information technology architecture in 1996 and prepared its most recent draft in May 1996. State's first tactical plan called for the Department to have a key component of its information technology architecture in place and validated by the end of fiscal year 1997. However, almost a year later, the documents describing the architecture are incomplete and have not been endorsed by management or validated by affected offices and bureaus across the Department.

### Implementation of the IT Framework Has Not Been a Top Priority

The Department has not made its IT planning and investment framework a top priority. Evidence to support this view includes the fact that State did not respond to OMB's request to all federal agencies to report by May 1, 1997, on progress in implementing the IT planning and investment processes required by the Clinger-Cohen Act. Of the 28 executive agencies identified in OMB's memorandum, State was the only agency that did not respond to OMB's request. Also, we noted that a senior manager with lead responsibility for implementing State's modernization program was not aware that the Department had prepared a draft information technology architecture until we brought it to his attention.

State officials attributed delays in implementing the framework to a number of additional factors, including senior management turnover, internal reorganizations, competing priorities such as the Year 2000 and computer security issues, staffing shortages, and a general lack of vision regarding the Department's technical direction and operational requirements. Specifically, State officials noted:

- Since March 1996, State has had two Under Secretaries for Management, one Acting Chief Information Officer, and two Chief Information Officers. The most recent Chief Information Officer was appointed in May 1998. In addition, a major reorganization of the Office of Information Management

<sup>8</sup>Funding Information Systems Investments, OMB Memorandum M-97-02 (Washington, D.C.: OMB, Oct. 25, 1996) and Information Technology Architectures, OMB Memorandum M-97-16 (Washington, D.C.: OMB, June 18, 1997).

occurred in early 1997, and a second major reorganization took place in March 1998 when the Office of Information Management was placed under the Chief Information Officer, thus eliminating a long-standing division between policy development and operations.

- Year 2000 and computer security concerns have largely consumed the Department's resources and attention.
- Chronic staffing shortages have contributed to implementation delays, for example, State's IT architecture function was supposed to be supported by eight full-time staff members; however, until recently, only one full-time employee was dedicated to this function.
- The Department lacks a clear sense of technical direction and operational requirements. The absence of a clear and reasonable technical direction, that is widely articulated and agreed to by senior Department officials, is hampering State's ability to properly plan its IT investments and evaluate its IT projects.

State's Chief Information Officer recently told us that he is committed to implementing the Department's IT planning and investment framework and has taken steps to ensure that this occurs. For example, the Chief Information Officer has drafted an ITM vision statement for the Department and has called for the ITM Technical Review Board to hold its first operational meeting this September.

## Cost Estimate in the Strategic Plan Is Speculative

State's projected 5-year ITM costs of \$2.7 billion are speculative for a number of reasons. First, the estimate is not based on a rigorous analysis of project requirements as anticipated in State's conceptual IT planning and investment framework. Rather, the cost estimate in State's strategic plan was largely developed by the Office of the Chief Information Officer on the basis of certain operating assumptions, which were developed in the absence of a fully functioning IT planning and investment process that should have included an independent assessment of these assumptions and cost data by a technical review group as called for in State's framework.

In addition to this basic shortcoming, State's estimate did not include about \$600 million in Consular Affairs' related IT costs. For fiscal year 1998, Consular Affairs has been allocated a total of \$139 million for IT-related activities, including its visa processing and name check systems that are installed at posts around the world. Consular Affairs' costs would have added approximately \$600 million to State's original \$2.7 billion estimate. State officials told us that these costs were left out of the

estimate because they assumed that the costs would be offset by expected revenues from machine-readable visa fees. However, State's conceptual framework suggests that all costs should be included in the Department's long-term IT funding projections.

After State released its IRM cost estimate in October 1996, the Department determined that its requirements and cost estimates for some key items will have to be revised. Five key requirements in State's 5-year funding estimate that will likely need updating are (1) bandwidth,<sup>9</sup> (2) classified local area networks overseas, (3) a change in State's messaging platform plans, (4) capital replacement needs, and (5) anticipated changes to State's communication networks. In addition, the potential adoption of a new worldwide communication system could have cost implications for State. The following discussion provides data on the magnitude of these new requirements and, where available, the potential cost implications.

- State's original estimate assumed that \$393 million would be needed to meet projected bandwidth requirements over the 5-year planning period. According to State documents, this estimate was largely an "educated best guess." State subsequently launched a separate tactical plan project designed to more accurately gauge, among other items, the Department's long-term bandwidth requirements. Preliminary survey results from this project for fiscal year 2000 suggest the Department needs to update its projected bandwidth requirements.
- State's original cost estimate did not specifically identify the cost or number of classified local area networks required at overseas posts. However, State's current tactical plan has identified the potential need for 200 classified local area networks overseas (which is double the current number) at a total projected cost of \$167 million.
- One of the core assumptions in State's cost estimate was that State would implement a new messaging system based on the Defense Messaging System at an estimated cost of \$127 million. The Defense Messaging System is designed to handle both classified and unclassified messaging needs. However, State has deferred its implementation of the system pending full adoption of the system by the Department of Defense. State's IRM tactical plan estimates that the Defense Messaging System may not become fully operational until 2005 and estimates that its interim messaging system will cost \$37.2 million through fiscal year 2004.
- State's cost estimate does not include all of the Department's latest IT equipment and software replacement requirements as defined in the

<sup>9</sup>"Bandwidth" is a measure of the amount of information that can be carried over a communication line at any given moment.

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February 1998 tactical plan. A formal replacement schedule and related budget estimates will need to be developed to include such items as network servers, routers, hubs, gateways, printers, and operating system software. These costs could amount to millions of dollars annually.

- State is currently considering a number of options to streamline the operations of the three separate communication networks described in the cost model. These changes will have cost ramifications not anticipated in State's original cost estimate.

In addition, the Diplomatic Telecommunications Service Program Office, which provides overseas telecommunications services to State and 46 other federal agencies, is currently testing a new communication system known as the Black Router Network. Full implementation costs for this network have not yet been identified but will run in the millions. If it is adopted, State would have to pay a significant portion of these costs.

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### Cost Savings and Efficiencies From Modernization Not Identified

State has not identified or quantified potential cost savings or efficiencies from its modernization program. State's IRM strategic plan lists the achievement of greater economies in IT resource management as a major goal. However, no clearly identified and quantified cost savings opportunities are discussed in its cost estimate or plans. In addition, State has not attempted to benchmark the performance of its IT operations, including the cost-effectiveness of its operations, against comparable public and private sector organizations as called for by the Clinger-Cohen Act.

State officials acknowledge that there are opportunities to reduce costs and achieve efficiencies in IT operations through the modernization effort. State officials cited consolidation of local area network servers, mainframe centers, network operating centers, and help desks; remote system management; and the closing of communication centers as prospects for achieving potential cost savings or instituting efficient operations. However, in these and other cases, State has not developed specific cost-saving strategies or estimates. For example, the potential for closing communication centers overseas in response to the introduction of desktop cable delivery systems has long been debated as a potential cost-cutting measure in State.<sup>10</sup> However, these discussions have never progressed to the stage where actual strategies and expected results have been laid out. The practical impact of implementing such a reform was

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<sup>10</sup>State's overseas communication centers are staffed with an estimated 530 employees. According to a State official, these employees generally have additional duties, such as assisting with mail and pouch activities, which are not connected with the communication center's operations.

described by Canadian Foreign Ministry officials we spoke with who explained that their adoption of a modern messaging system led to the closure of all overseas communication centers and the termination, retirement, or reassignment of 160 communication workers.

State has generally not benchmarked the cost-effectiveness of its operations against comparable public and private sector organizations as suggested by the Clinger-Cohen Act. This type of analysis is referred to as "metrics benchmarking" and entails the use of quantitative measures such as reference points for comparison against prior experience, industry norms, or best-in-class organizations. Metrics benchmarking can range from broad comparisons using such measures as the percent of total operating costs devoted to IT activities to more finely drawn comparisons, such as the average cost to respond to a help desk call. Once specific cost comparisons are made and problem areas are identified, best practices benchmarking can be used to identify the practices and techniques employed by top organizations to realize cost savings or to operate more efficiently in these target areas.

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## Conclusions and Recommendations

State has launched an ambitious modernization program in support of its IRM strategic plan. Under its current approach, State's modernization effort may not achieve desired goals within reasonable costs and timeframes. To date, the Department has not made the full implementation of its IT planning and investment framework a top priority and significant portions of the framework remain to be implemented. Absent a fully implemented framework and the adoption of the best practices included in recent federal legislation and related guidance from OMB and GAO, State's large IT modernization program is at risk. In addition, State's has failed to adequately identify the current scope and costs of its IT operations over a 5-year period. Such projections should include explicit consideration of expected cost savings from streamlined operations, the deployment of advanced technology, and the utilization of more efficient work processes and methods.

We recommend that the Secretary of State make the development of a fully implemented IT planning and investment process a top priority. The Secretary's implementation strategy should include

- establishing a fully functioning IRM Technical Review Board and IRM Configuration Control Board,

- establishing a validated information technology architecture to help guide the Department's IRM modernization and ongoing IT support decisions,
- revising (once the boards and architecture are in place) the strategic and tactical plans and 5-year cost estimate and identifying potential cost savings or efficiencies expected from the modernization effort, and
- establishing specific milestones for completing the full implementation of the IT planning and investment process, and a mechanism to measure progress against these milestones.

## Agency Comments and Our Evaluation

In written comments on a draft of this report, State concurred with the overall thrust of our report and noted that several steps had recently been initiated to implement many of our recommendations. State noted that they are (1) reconstituting and reconvening the IRM Technical Review Board; (2) ordering the formation of a Departmentwide Configuration Control Board; (3) drafting an IT vision paper that will serve as the foundation for, among other key planning documents, an agency-validated information technology architecture; and (4) planning to release a revised long-term IT funding estimate that will include actual and potential cost savings resulting from State's modernization efforts. We believe these steps are positive indicators of the Department's intentions to fully implement its IT planning and investment framework.

State commented that our report did not sufficiently describe State's IT modernization initiatives and accomplishments. It noted that its IT planning process has been improved and progress has been made in modernizing its infrastructure. State highlighted two projects that it considers to be successful—its efforts to modernize its unclassified computer and communication systems and its consular affairs systems. We recognize that State has implemented several modernization projects; in fact, our report specifically states that the Department has a number of key modernization projects underway. However, as our report notes, we did not evaluate the progress or effectiveness of individual projects.

State also noted that our report cites only "one example" of a failed modernization program—its efforts to modernize its financial management system—as evidence that State has experienced difficulties in achieving its short- and long-term modernization goals. We cite this example to illustrate the difficulties and risks associated with implementing a large-scale, complex IRM project in the absence of a rigorous planning and investment framework. We believe that State's difficulties in implementing a key modernization program such as financial management are significant

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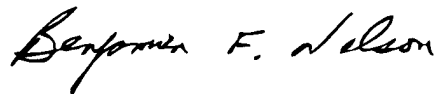
and point to the need for full implementation of State's IT planning and investment framework.

Our report objectives, scope, and methodology are described in appendix I, and the Department of State's written comments are reprinted in their entirety in appendix II.

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We are providing copies of this report to the Secretary of State, the Director of OMB, and to other interested congressional committees. Copies will also be sent to others upon request.

Please contact me on (202) 512-4128 if you or your staff have any questions concerning this report. Other contributors to this report are listed in appendix III.

A handwritten signature in black ink that reads "Benjamin F. Nelson". The signature is written in a cursive, slightly slanted style.

Benjamin F. Nelson, Director  
International Relations and Trade Issues





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## Abbreviations

IRM	Information Resource Management
IT	information technology
OMB	Office of Management and Budget



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# Objectives, Scope, and Methodology

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To provide information and analysis on the progress made by State in implementing key information technology (IT) management processes mandated by recent federal legislation and related guidance, we compared State's IT management framework to criteria described in the Office of Management and Budget's (OMB) recently issued Capital Programming Guide<sup>1</sup> and our guide for assessing IT investment decisions.<sup>2</sup> These documents outline a disciplined approach to managing IT resources and embody the best practices incorporated in several recent pieces of federal legislation, including the 1995 Paperwork Reduction Act<sup>3</sup> and the 1996 Clinger-Cohen Act.<sup>4</sup> We met with State officials to determine their interpretation and implementation of these various legislated requirements. We focused on State's overall IT planning and investment management process and how policy and tactical-level funding decisions are made. We did not review individual IT projects for adherence with specific best practices or whether these projects have been satisfactorily managed.

To provide information and analysis on the extent to which State has developed a sound 5-year funding estimate, we reviewed the October 1996 cost model prepared by State to justify its \$2.7-billion cost projection as outlined in its 1997 strategic plan for fiscal years 1997-2001. We spoke with State Department officials responsible for developing this estimate and reviewed the methodology used to compile the data in the cost model. We also obtained and analyzed available cost data and funding analyses prepared after the release of the cost model in October 1996 to determine what impact they might have on long-term cost trends and planning assumptions. Where possible, we attempted to quantify the potential impact of major planning changes. For example, we sought to identify the dollar cost associated with State's revised communication bandwidth requirements needed to support its modernized information systems. Finally, we reviewed the latest version of the information resource management (IRM) tactical plan, which includes funding projections for individual modernization projects, to determine if baseline funding estimates for certain cost model items had been significantly revised.

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<sup>1</sup>Capital Programming Guide (Washington, D.C.: OMB, July 1997).

<sup>2</sup>Assessing Risks and Returns: A Guide for Evaluating Federal Agencies' IT Investment Decision-making (GAO/ALMD-10.1.13, Feb. 1997).

<sup>3</sup>Public Law 104-13, 109 Stat. 163.

<sup>4</sup>Public Law 104-106, 110 Stat. 679.

To analyze whether State had identified and implemented potential cost-cutting opportunities, we reviewed State's 1997 IRM strategic plan, each of the summary project statements included in the IRM tactical plan, and tactical plan project papers. We analyzed each of these documents to determine if specific cost-cutting measures were discussed and to what extent attempts were made to quantify any expected cost savings.

We met with a broad range of State officials, a former Chief Information Officer, a former Acting Chief Information Officer, the Deputy Assistant Secretary for Information Management, tactical plan project managers, technical personnel, bureau IT representatives, and representatives from State's Office of Inspector General. We also met with IT professionals from the U.S. Agency for International Development, the U.S. Information Agency, and the Diplomatic Telecommunications Service Program Office, and with Foreign Ministry representatives from Australia, Canada, and New Zealand. To obtain additional outside views on State's IT modernization program, we met with officials from the Central Intelligence Agency and OMB. We also met with government contractors from Lockheed Martin to discuss the Defense Messaging System that State had originally proposed to implement. We also met with Mobil Oil Corporation's Chief Information Officer to discuss Mobil's recent IRM modernization effort, which has been highlighted in IT literature as a "model" reform effort.

We reviewed a wide number of prior reports and studies that have examined State's IRM operations, including our December 1994 report<sup>5</sup> on State's information management practices, our August 1998 report<sup>6</sup> on State's Year 2000 remediation efforts, and our June and July 1998 reports on the status of State's Results Act planning efforts.<sup>7</sup>

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<sup>5</sup>Department of State: Strategic Approach Needed to Better Support Agency Mission and Business Needs (GAO/AIMD-95-20, Dec. 22, 1994).

<sup>6</sup>On January 1, 2000, computer systems that are not Year 2000 compliant will malfunction or produce inaccurate information because the year 2000 will be indistinguishable from the year 1900. This problem is rooted in the fact that many computer systems use only two digits to designate the year. We recently reported on State's progress in addressing Year 2000 issues. See Year 2000 Computing Crisis: State Department Needs to Make Fundamental Improvements to Its Year 2000 Program (GAO/AIMD-98-162, Aug. 28, 1998).

<sup>7</sup>The Government Performance and Results Act of 1993 (P.L. 103-62, 107 Stat. 285), commonly referred to as the Results Act, requires that all federal agencies set goals, measure performance, and report on their accomplishments. As such, an agency's IT investments should directly support the accomplishment of these goals, and agency Results Act planning documents should clearly establish this linkage. See The Results Act: Observations on the Department of State's May 1997 Draft Strategic Plan (GAO/NSIAD-97-198R, July 18, 1997) and The Results Act: Observations on the Department of State's Fiscal Year 1999 Annual Performance Plan (GAO/NSIAD-98-210R, June 17, 1998).

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**Appendix I**  
**Objectives, Scope, and Methodology**

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We performed our work at State's headquarters in Washington, D.C., and visited Ottawa, Canada, to meet with IT officials from the Canadian Foreign Ministry to discuss their ongoing IRM modernization program and to tour the U.S. embassy's IT operations in Ottawa.

We conducted our review between April 1997 and May 1998 in accordance with generally accepted government auditing standards.

# Comments From the Department of State



United States Department of State

Chief Financial Officer

Washington, D.C. 20520-7427

September 16, 1998

Dear Mr. Hinton:

We appreciate the opportunity to review your draft report, "DEPARTMENT OF STATE IRM: Modernization Program at Risk Absent Full Implementation of Key Best Practices," GAO Job Code 711268.

Enclosed are the Department's comments for incorporation in the report. If you have any questions concerning this response, please contact Mr. Donald C. Hunter, Deputy CIO, Architecture and Planning, at (202) 776-8977.

Sincerely,

  
Kathleen J. Charles, Acting

Enclosure:

As stated.

cc:

GAO/NSIAD - Ms. Glod  
- Mr. ten Kate  
STATE/IRM/AP - Mr. Hunter

Mr. Henry L. Hinton, Jr.,  
Assistant Comptroller General,  
National Security and International Affairs,  
U.S. General Accounting Office.

**Department of State Comments on the GAO Draft Report,**

**“DEPARTMENT OF STATE IRM: Modernization Program at Risk Absent Full  
Implementation of Key Best Practices,”  
GAO/NSIAD-98-242, GAO Job Code 711268**

The State Department welcomes this General Accounting Office report and its suggestions on how we can improve our essential Information Resource Management (IRM) planning and modernization initiatives. The audit report provides a useful summary of State's initial efforts to modernize the vast information technology infrastructure deployed in support of the nation's global diplomatic mission. We concur with the report's overall thrust and, in fact, are well underway implementing many of its recommendations.

However, we believe the draft does not sufficiently describe the many IT modernization initiatives and accomplishments the Department already has achieved. The IT planning process has been greatly improved and we have made major progress in modernizing our infrastructure. We believe these improvements, which are described in detail below, directly affect the report's conclusions and should be included.

**Improved IT Planning and Management**

In February 1998, Congress approved the Department's proposal to realign the majority of information technology and resource management functions of the former Office of Information Management from the Bureau of Administration to the Office of the CIO. This action has consolidated information technology programs under the leadership of one centrally managed office, and thereby enhanced the focus and control over information technology issues.

In May 1998, a new Chief Information Officer (CIO), with over 20 years of professional experience in all facets of IT, arrived and took immediate steps to improve IT planning and management in the Department. For example, he elevated the Year 2000, IT security and planning and Architecture to the Deputy CIO level. He oversaw the creation of an IT vision paper that outlines the major new directions that our strategic plan, cost model and architectures must move after the year 2000. He enhanced the IRM investments review process, reconstituted and reconvened the Technical Review Board, and ordered the formation of a Department-wide Configuration Control Board. He also continued a formal process begun earlier in the year to review all major bureau IT projects monthly. During these reviews, the progress of each project is monitored and project managers report anticipated changes to established milestones. Senior IRM Bureau managers also conduct bi-weekly project monitoring meetings to ensure that all projects receive ongoing individual management attention.

In addition to these recent accomplishments, there have been other improvements under way for some time. In January 1997, we created the Department's first IRM

Strategic and Performance Plan (as mandated by the Government Performance and Results Act of 1993) and the first IRM Tactical Plan. These plans, along with the Department's overall Strategic Plan and Performance Plan, have greatly improved the definition of State's business requirements and the integration of IT planning with other administrative and substantive planning. The Tactical Plan was newly created to enhance the ability of the Department to identify and coordinate its many IT initiatives and effectively fund them. OMB, the Congress, and GAO itself had praised this document, and its format is being copied by agencies such as HUD. The Department has derived and established appropriate IRM priorities by using these documents and providing significant focus to previously uncoordinated IT initiatives.

Integration of IRM planning with other planning processes in the Department has also been and continues to be improved by the establishment of a new IRM Bureau under the direct management of the Department's permanent CIO. In February 1998, Congress approved the Department's proposal to realign the majority of information technology and resource management functions of the former Office of Information Management from the Bureau of Administration to the Office of the CIO. This action has substantially consolidated information technology programs under the leadership of one centrally managed office, and thereby enhanced the focus and control over information technology issues.

In addition, the new CIO has instituted a monthly formal review process for all major. During these reviews, the progress of each project is monitored and project managers report anticipated changes to established milestones. Senior IRM Bureau managers also conduct bi-weekly project monitoring meetings to ensure that all projects receive ongoing management attention.

The IRM Bureau has already prepared an IRM Bureau Performance Plan to support the diplomatic, consular, and management priorities stipulated in the Department's Strategic Plan. The IRM Bureau's Performance Plan was required as part of the Department-wide performance planning effort. Included for the first time in the current effort is IRM resource data reports from all bureaus and overseas posts. While this information still needs to be validated, it will provide the foundation for a more comprehensive accounting of State's total IRM investments.

In addition, the Department-wide IRM Tactical Plan has now been adjusted to reflect the priorities and emerging strategies being developed in our revised IRM Strategic and Performance Plan and enables a more thorough integration of the IT planning, budgeting and investment evaluation process. This initiative is aiding the Department in its efforts to implement sections 5121 and 5123 of the Clinger-Cohen Act, and assure maximum value for the IT dollars it spends. As alluded to above, under the direction of the Department's new CIO, the Department has developed a detailed IT vision paper for fiscal year's 2001 - 2005, which is now being reviewed within the Department prior to being made public. Once approved, the vision paper will serve as the foundation for a new IRM Strategic and Performance Plan and drive the development of technical architectures as called for in section 5125 of the Clinger-Cohen Act.



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Appendix II  
Comments From the Department of State

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The IRM Program Board, chaired by the Under Secretary for Management, continues to review all major new and on-going IRM projects. The IRM Program Board focuses on the priorities established in the Department's Strategic Plan and the derivative IRM Tactical Plan in evaluating projects presented to it. An increasingly rigorous process is being implemented to assure decisions on IT investments are in keeping with federal requirements. For example, beginning with the September 1998, IRM Program Board, each project manager is required to describe and document how their project meets the Department's IT performance goals in four specific areas. Additionally, projects must incorporate defined performance measures, both output (efficiency) and outcome (effectiveness) to demonstrate progress and the benefits to be derived by the initiative.

The Department has not fully implemented the three inter-related oversight boards in the manner it originally envisioned as described in its 1996 framework documents. Yet, since its inception in 1997, the IRM Program Board has informally carried out many of the roles that we initially anticipated would be split among the three separate boards. The IRM Program Board has, for instance, systematically considered the technical merits of nearly all its programs – thus partially fulfilling the role of a Technical Review Board. And the IRM Program Board frequently revisits the funding decisions on previously approved IT initiatives throughout the project's lifecycle – thus acting in the capacity of a Configuration Control Board.

However, to better define and separate these important roles, the new CIO has recently reinstituted a Technical Review Board (TRB) to evaluate all major IRM projects for technical and architectural compliance before funding consideration by the IRM Program Board. The first TRB convened in early September to consider projects seeking FY 1999 IRM central fund allocations. As currently constituted, the TRB members are the most senior, technically qualified managers in the Department and represent a broad cross section of bureaus and offices. Several additional TRB meetings are already being scheduled (another one is scheduled for the week of September 28, 1998) to review the draft technical architectures, initial IT vision paper, and other key IRM initiatives as the TRB procedures continue to be refined.

Similarly, the Department is now establishing a Configuration Control Board to assure that projects, once funded, remain on track and meet their projected milestones while supporting the Department's overall technical direction. The largest, single modernization program in the Department, A Logical Modernization Approach (ALMA) Project has, for about 18 months, successfully operated such a board, which has met on over 30 occasions to keep the project on track, within budget, and true to its original goals. The new CIO is expanding this proven body to function Department-wide beginning in early FY 1999. Once implemented, the IRM Configuration Control Board will fulfill sections 5113 and 5121 of the Clinger-Cohen Act and provide a standard means for senior managers to obtain timely information regarding the progress of all major IT investments.

The Department has also included IRM workforce planning as part of our overall human resource planning and modernization efforts. The IRM Bureau is working closely with the Department's Bureau of Personnel and the Foreign Service Institute, responsible for State's education and training programs to accomplish this initiative. Joint efforts underway are focused on identifying the current knowledge, skills and abilities of our IT professionals, forecasting future skills and workload requirements, and developing a plan to address any skills shortfalls.

#### Technology Infrastructure Successes

While much work remains, the Department has made tremendous progress in modernizing its information technology infrastructure over the last several years. The report cites only one example of a failed modernization effort as evidence of the draft's conclusion that State has "experienced difficulties in achieving its short- and long-term modernization goals." Yet, the GAO report ignored the highly successful \$120 million ALMA program and the \$140 million Bureau of Consular Affairs global modernization programs in making such a negative statement. These two programs, which have been underway for nearly two years, are the foundation of the Department's global IT modernization. We recommend striking from the text of this report the following statements:

"For example, in August 1994, we reported that State's attempt to modernize its financial management systems was subject to a high risk of failure because the Department's management and planning for this effort had been inadequate. Subsequently, in 1995 State ended this effort and adopted a revised approach to modernizing its domestic and overseas financial system."

Our position for excluding this text is based on the age of the reference (over 4 years old) and the relative magnitude of this effort when compared to other efforts cited in this response. Additionally, we recommend the following revisions to the second statement in the referenced passage:

"Subsequently in 1995, State adopted a revised approach to modernizing its domestic and overseas financial systems."

The Department's flagship modernization effort, ALMA, has been highly successful. Through ALMA, the Department is deploying a fully modernized unclassified computer and communications system that will, when complete, support enhanced office automation, modernized bureau and Department-wide corporate applications, and improved access to information age technologies, such as the Internet, video teleconferencing and geographic information systems data. ALMA is the most complex and aggressive IT modernization program ever attempted by State and is on schedule and within 2 percent of budget. Over half of the 230 overseas posts scheduled to receive the ALMA infrastructure by the end of FY 1999 are complete. The conduct of U.S. foreign policy is being enhanced by ALMA as Department officers gain access to business quality e-mail and office automation tools. ALMA also provides the underlying

infrastructure for other Y2K and IT modernization projects. In accomplishing ALMA, the IRM Bureau is working with the Foreign Service Institute for training, the Diplomatic Telecommunication Service Program Office for global communications, and the Consular Affairs modernization program, which is also on schedule and within budget for its modernization efforts. These major IT initiatives highlight State's dedication to effective project management principles. The ALMA program will have modernized all overseas posts scheduled for updating by the end of FY 1999.

The IT modernization program sponsored by the Bureau of Consular Affairs is progressing on target as well. To date, 75 percent of the worldwide non-immigrant visa volume is now handled by modernized systems and we are on track to complete the entire project by July 1999. Additionally, all users now have access to the enhanced CLASS namecheck system, which allows posts to transmit and receive automated information on visa and passport applicants in real-time, 24 hours a day, at every Foreign Service post and in every passport agency. The total effect of the modernization effort undertaken by the Bureau of Consular Affairs, in conjunction with the IRM Bureau is new consular systems that enhance U.S. border security by allowing the production of more secure travel documents and better control who receives these documents.

In addition, the Department has achieved significant progress implementing a variety of other information technology modernization projects. All of these projects are included in IRM's Strategic and Performance Plan and further State's overall modernization interests. At the same time, they will contribute to advancing the goals contained in the preliminary IT vision paper now being circulated. During the past two years State has accomplished the following:

- Acquired new mainframe computers for its two mainframe processing sites, the Main State Data Processing Center and the Beltsville Messaging Center. These upgrades have significantly enhanced the Department's ability to conduct data-intensive computing applications such as performing security background checks on the names and potential aliases of all foreign visa applicants seeking to visit the United States.
- Made major progress in deploying a high-speed switched data network to support the Department's headquarters. This project will ultimately extend the high-speed network to all locations in the metropolitan Washington area, thereby providing America's diplomatic headquarters with state-of-the-art communications and information management connectivity.
- Installed new telephone systems to replace obsolete systems at 39 U.S. embassies and consulates.
- Deployed new emergency satellite systems to regional locations throughout the world to ensure quick response in crises. These systems were essential to quickly and effectively restoring communications to the embassies recently bombed in East Africa.

- Made certain that all posts' telegraphic communications processor systems are Year 2000 compliant, thereby ensuring that the Department's official diplomatic communications channels will work reliably at the turn of the century.
- Upgraded the Department's domestic communications center. This upgrade improved the center's capacity to act as the hub for receipt, authentication and delivery of all official message traffic between the Department, U.S. diplomatic missions and other U.S. Government locations worldwide.
- Instituted and assured the on-going, systematic training of IRM project managers as a key element of implementing a thorough and consistent project management approach to new and existing IT initiatives. Over 250 Department managers have been trained in the Managing State's Project methodology.

#### **Leveraging Other IT Efforts**

The new CIO has effectively addressed some of the key IT management priorities that have been the focus of previous GAO audit reports in the last several months. In aggressively dealing with these challenges, such as the Year 2000 problem and enhancing IT security, the IRM Bureau is now poised to raise the priority of and devote the appropriate FTE needed for IT architecture and planning. It is true that by aggressively addressing Year 2000 vulnerabilities and IT security, full implementation of State's IT planning processes and architecture development have been delayed. However, the focus on Year 2000 has resulted in a Department-wide configuration management process for all software applications and allowed all of the Department's network interdependencies to be fully known and diagrammed. These efforts will benefit the development of IT architectures and significantly assist projects meet requirements of the enterprisewide Configuration Control Board, now under development.

GAO's draft makes reference to the lack of staff assigned to architecture development and the IT planning office. This, indeed, has been a challenge over the course of the past year. For the past three to four years the entire IRM Bureau was plagued by a vacancy rate of nearly 30 percent. This staff shortage has hampered many IT initiatives – planning and architecture among them. However, the new CIO has made recruiting a top priority and we have been steadily reducing this number. The development of an IT architecture has now been accelerated. The new CIO has named three deputies and elevated their responsibilities for key IT management areas. The Year 2000 Project Management Office is now directed by a Deputy CIO and the responsibility for IT security has also been elevated to a Deputy CIO position. Increased focus is now on fully implementing a robust and integrated IT planning and architecture function. Earlier in 1998, the divided responsibility for architectures was resolved by appointing a Deputy CIO charged with guiding the improvements in IT planning and architecture and a new IT architecture team was named.

**Response to GAO Recommendation**

The various actions outlined above have significantly improved the IT planning and investment processes in the State Department. These successful programs provide a firm foundation for our continuing efforts to strengthen IRM planning and develop an enterprisewide IT architecture as required by the Clinger-Cohen Act and to which the Department is committed. The following sections, addressing the four specific elements of the recommendation for an IT planning and investment implementation strategy in the GAO report, detail how we are moving to build upon our recent related accomplishments.

**Element 1:** Establish a fully functioning IRM Technical Review Board and IRM Configuration Control Board.

**State Department Response:** The Department is in the process of establishing a fully functioning IRM Technical Review Board and IRM Configuration Control Board as originally envisioned in 1997 and as recommended by the Clinger-Cohen Act. The second formal meeting of the IRM Technical Review Board was held on September 9, 1998 and the next meeting will be held the week of September 28, 1998. While this Board is just becoming functional at this juncture, we have established this Board and we are moving aggressively to strengthen its organization. The Department also has established a Configuration Control Board associated with our primary modernization effort, ALMA. As ALMA is setting standards and deploying the basic foundation for the vast majority of the Department information systems, we are also in the process of expanding this ALMA Configuration Control Board's authority into a Department-wide Configuration Control Board. This effort is now underway and we expect to have it in place by January 31, 1999.

**Element 2:** Establish a validated information technology architecture to help guide the Department's IRM modernization and ongoing IT support decisions.

**State Department Response:** The Department has done much to establish a consistent information technology, based on open systems standards. In the ALMA program, for example, the Department has already established and documented an IT architecture for its global infrastructure. That architecture is the underlying basis for all the ALMA standards, is detailed, widely available, and has been disseminated by cable and the Department's Intranet. The ALMA technology architecture established the Department's direction towards Internet Protocol (IP) based networks, Windows NT operating systems, and many other standards. State Department's preliminary IT vision paper, referenced in the GAO report, is focused on Fiscal Years 2001 – 2005 and, once approved, will describe how new IT initiatives and priorities will aid the Department to move in new, business-centered directions. These directions will be more fully detailed in the Department's next Strategic Plan and supported by a set of specific IT architectures that will help govern the numerous ongoing and emerging IT initiatives.

The Department's current draft Tactical Plan (dated July 1998) specifies concrete milestones for the development and dissemination of detailed architectures. These information architectures will include technical definitions related to security, network operations, information services, applications, and data. An initial architectures document will be published by the end of the first quarter FY1999 and the remaining standards will be completed by the end of FY1999. The Department is committed to and engaged in establishing robust and comprehensive IT architectures. However, it is important to note that IT architectural efforts are, by their nature, always in progress and must be adjusted to a constantly changing information technology environment. In this regard and in relationship to the GAO recommendation, an IT architectural effort is never entirely "done," but is instead an evolving process that guides and structures IT initiatives.

**Element 3:** Revise (once the boards and architecture are in place) the strategic and tactical plans and 5-year cost estimate and identifying potential cost saving or efficiencies expected from the modernization effort.

**State Department Response:** The Department has already begun to revise its IT strategic and tactical plans to better reflect the business requirements and resource constraints stipulated in the Department of State Strategic Plan and associated performance planning process, as mandated by the Government Performance and Results Act. In addition, the preliminary IT vision paper sets a new technical direction for the Department, making the previous IRM Strategic and Performance Plan, and associated cost model, no longer valid as a future vision for the Department. Once the IT vision paper is finalized and a new IRM Strategic Plan is developed in the coming months, State will have the foundation to articulate its overriding technical framework and produce a new, more accurate and viable cost model. Senior Department officials and IRM managers recognize that its 1997 Strategic and Performance Plan no longer portrays the current state or future direction State will take in this rapidly evolving age of information technology. In FY1999, the Department will publish a new Strategic Plan that will be built upon a defined set of IT architectures and underscored by fully implemented planning and investment boards responsive to the intent of the Clinger-Cohen Act. For example, the 1998 IRM Tactical Plan includes the following guiding principle.

"The IRM Bureau is exploring the operational and economic feasibility of developing a secure large-scale unclassified information network to link all of State internally via an Intranet; and, this same network would link the Department to the world via the Internet and the World-Wide Web. To handle the relatively small percentage of information that is truly classified, we would deploy a smaller scale classified system."

This modernization approach would do much to reduce costs and enhance efficiencies as the GAO suggests, and the Department is pursuing this and other initiatives in order to identify and reduce costs and increase effectiveness and efficiencies.

**Element 4:** Establish specific milestones for completing the full implementation of the IT planning and investment process, and a mechanism to measure progress against these milestones.

**State Department Response:** Under the new CIO, the Department has initiated a process to develop a new IRM Strategic Plan to guide IT efforts from 2000 – 2004. To date, we have developed a high-level IT vision paper that highlights five broad IT goals for the new millennium. This conceptual paper is being circulated in conjunction with briefings and technology demonstrations to build consensus for a new strategic vision. We anticipate this new strategic vision will be published by the end of the first quarter FY1999. The new vision contains specific steps for developing performance metrics to assess the success of the Department's efforts to fully implement a coherent IT planning and investment process. And, while a number of significant improvements have already been adopted in the development of the current tactical plans, an ongoing process of improvement is underway to better incorporate both the spirit and the letter of GPRA. Each iteration of the tactical plan has resulted in the institution of better means to evaluate the progress the sponsoring office or bureau makes in achieving its IT milestones.

In closing, we fully recognize the critical importance of IT to the support of U.S. diplomacy and the effectiveness of the State Department in the information age. While significant results have been achieved in modernizing and improving our IT, there is more to do. We continue to strengthen our IT efforts by enhancing IT management oversight and investment planning at the State Department. We understand the need to specifically address the Clinger-Cohen Act and related OMB mandates as they relate to a strong IT planning and investment processes, an articulated technology architecture, and a comprehensive strategic technology vision. As such, the CIO has directed the IRM Bureau to take the lead in prioritizing these requirements and has set as a goal for the Department to become a model organization operating in conformance with applicable federal regulations and proactively managing a results-based IT environment.

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